

September 2007

# GLOBAL HEALTH

## U.S. Agencies Support Programs to Build Overseas Capacity for Infectious Disease Surveillance



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Report Documentation Page				Form Approved OMB No. 0704-0188	
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1. REPORT DATE <b>SEP 2007</b>		2. REPORT TYPE		3. DATES COVERED <b>00-00-2007 to 00-00-2007</b>	
4. TITLE AND SUBTITLE <b>Global Health. U.S. Agencies Support Programs to Build Overseas Capacity for Infectious Disease Surveillance</b>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>U.S. Government Accountability Office, 441 G Street NW, Washington, DC, 20548</b>				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>Same as Report (SAR)</b>	18. NUMBER OF PAGES <b>57</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			

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# Highlights

Highlights of [GAO-07-1186](#), a report to congressional requesters

## Why GAO Did This Study

The rapid spread of severe acute respiratory syndrome (SARS) in 2003 shows that disease outbreaks pose a threat beyond the borders of the country where they originate. Over the past decade, the United States has initiated a broad effort to ensure that countries can detect any disease outbreaks that may constitute a public health emergency of international concern. Three U.S. agencies—the Centers for Disease Control and Prevention (CDC), the U.S. Agency for International Development (USAID), and the Department of Defense (DOD)—support programs aimed at building this broader capacity to detect a variety of infectious diseases.

This report describes (1) the obligations, goals, and activities of these programs and (2) the U.S. agencies' monitoring of the programs' progress. To address these objectives, GAO reviewed budgets and other funding documents, examined strategic plans and program monitoring and progress reports, and interviewed U.S. agency officials. GAO did not review capacity-building efforts in programs that focus on specific diseases, namely polio, tuberculosis, malaria, avian influenza, or HIV/AIDS. GAO is not making any recommendations.

The U.S. agencies whose programs we describe reviewed a draft of this report and generally concurred with our findings. They also provided technical comments, which we incorporated as appropriate.

To view the full product, including the scope and methodology, click on [GAO-07-1186](#). For more information, contact David Gootnick at (202) 512-3149 or [gootnickd@gao.gov](mailto:gootnickd@gao.gov).

## GLOBAL HEALTH

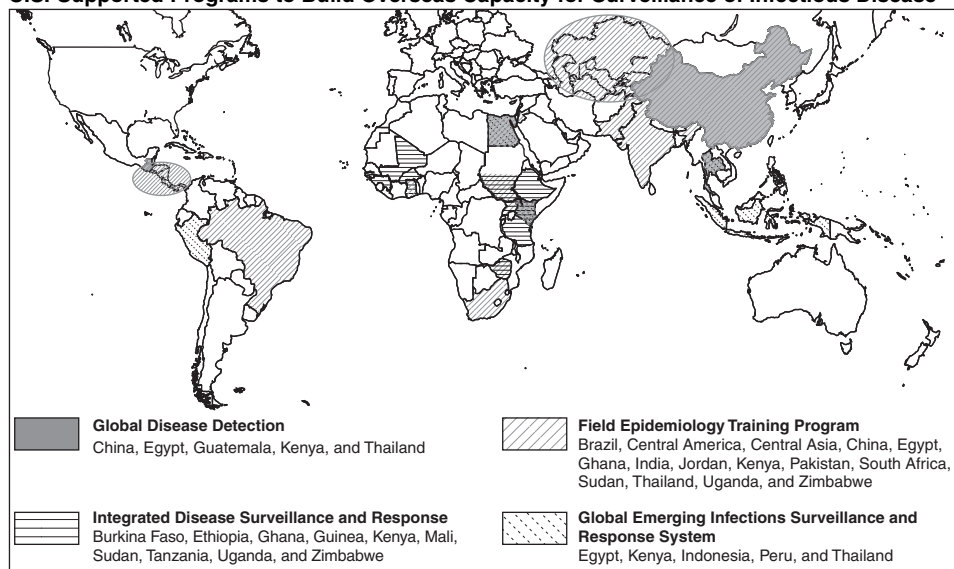
### U.S. Agencies Support Programs to Build Overseas Capacity for Infectious Disease Surveillance

#### What GAO Found

The U.S. government operates or supports four key programs aimed at building overseas surveillance capacity for infectious diseases. In fiscal years 2004-2006, U.S. agencies obligated approximately \$84 million for these programs, which operate in developing countries around the world. Global Disease Detection is CDC's main effort to build capacity for infectious disease surveillance in developing countries. The Field Epidemiology Training Programs, which CDC and USAID support, are another tool used to build infectious disease surveillance capacity worldwide. Additionally, USAID supports CDC and the World Health Organization's Regional Office for Africa in designing and implementing Integrated Disease Surveillance and Response in 46 countries in Africa, with additional technical assistance to 8 African countries. DOD's Global Emerging Infections Surveillance and Response System also contributes to capacity building through projects undertaken at DOD overseas research laboratories. USAID supports additional capacity-building projects in various developing countries. The responsible agencies coordinate with each other to limit duplication of their overseas efforts.

For each of the four key surveillance capacity-building programs, the U.S. agencies monitor activities such as the number of epidemiologists trained, the number of outbreak investigations conducted, and types of laboratory training completed. In addition, CDC and USAID recently began systematic efforts to evaluate the impact of their programs; however, because no evaluations had been completed as of July 2007, it is too early to assess whether these evaluation efforts will demonstrate progress in building surveillance capacity.

U.S.-Supported Programs to Build Overseas Capacity for Surveillance of Infectious Disease



Sources: GAO; Map Resources (map clip art).

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## Abbreviations

CDC	Centers for Disease Control and Prevention
DOD	Department of Defense
FETP	Field Epidemiology Training Program
GDD	Global Disease Detection
GEIS	Global Emerging Infections Surveillance and Response System
HHS	Department of Health and Human Services
IDSR	Integrated Disease Surveillance and Response
IEIP	International Emerging Infections Program
IHR	International Health Regulations
USAID	U.S. Agency for International Development
WHO	World Health Organization
WHO/AFRO	World Health Organization's Regional Office for Africa

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United States Government Accountability Office  
Washington, DC 20548

September 28, 2007

The Honorable Daniel K. Akaka  
Chairman  
Subcommittee on Oversight of Government Management, the Federal  
Workforce, and the District of Columbia  
Committee on Homeland Security and Governmental Affairs  
United States Senate

The Honorable Dianne Feinstein  
United States Senate

Infectious diseases are a leading cause of deaths worldwide and represent the third most common cause of death in the United States. As the rapid spread of severe acute respiratory syndrome (SARS) showed in 2003, disease outbreaks pose a threat beyond the borders of the country where they originate. The United States thus has a clear interest in building capacity abroad to identify and respond to outbreaks of infectious disease. Effective disease surveillance systems in other countries contribute to lower morbidity and mortality rates and improved public health outcomes, both in those countries and elsewhere in the world. Earlier efforts to improve surveillance worldwide focused on individual diseases, beginning with global influenza surveillance in the 1940s and followed by surveillance systems for smallpox and polio, among others. In the mid-1990s, recognizing the threat posed by previously unknown infectious diseases, the United States and other countries initiated a broader effort to ensure that countries can detect any disease outbreaks that may constitute a public health emergency of international concern. Three U.S. agencies—the Department of Health and Human Services' (HHS) Centers for Disease Control and Prevention (CDC), the U.S. Agency for International Development (USAID), and the Department of Defense (DOD)—have programs aimed at building this broader capacity to detect a variety of infectious diseases.

You asked us to describe U.S. efforts to build developing countries' broader capacity for infectious disease surveillance. This report examines (1) the obligations, goals, and activities of key U.S. programs to develop epidemiology and laboratory capacity and (2) U.S. agencies' monitoring of the progress achieved by these programs. We did not review capacity-building efforts in programs that focus on specific diseases, namely polio, tuberculosis, malaria, avian influenza, and HIV/AIDS.

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To describe the obligations, goals, and activities of the key U.S. programs to develop epidemiology and laboratory capacity for surveillance of infectious diseases in 2004-2006,<sup>1</sup> we reviewed annual budgets, grants, and project funding for four infectious disease surveillance programs: Global Disease Detection (GDD), Field Epidemiology Training Programs (FETP), Integrated Disease Surveillance and Response (IDSR), and the Global Emerging Infections Surveillance and Response System (GEIS). We also identified funding from USAID missions for these activities; examined CDC, DOD, and USAID strategic plans for combating infectious diseases abroad; and reviewed annual, progress, and accomplishment reports. In addition, we interviewed CDC, DOD, Department of State, USAID, and World Health Organization (WHO) officials responsible for implementing capacity-building activities. To assess how agencies were measuring the progress of their programs in building infectious disease surveillance capacity, we analyzed progress and accomplishment reports for all four programs, GDD and FETP frameworks for monitoring and evaluation, IDSR indicators to evaluate the success of the program, and assessments of the FETPs. Additionally, we interviewed officials from the respective programs and from WHO to understand how they monitored program progress. We determined that the budget and performance data that we obtained had some limitations, which are described in appendix I, but were sufficiently reliable for our purposes. We conducted our work from October 2006 through July 2007 in accordance with generally accepted government auditing standards. (For additional details on our objectives, scope, and methodology, see app. I.)

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## Results in Brief

In 2004-2006, CDC, USAID, and DOD obligated about \$84 million for four key programs and additional activities to develop capacity for the surveillance and detection of infectious diseases abroad.<sup>2</sup>

- *GDD*. CDC obligated about \$31 million for GDD capacity-building activities conducted at GDD centers in five countries.<sup>3</sup> The program's priorities are enhancing surveillance, conducting research, responding to outbreaks, facilitating networking, and training epidemiologists and laboratorians. Activities undertaken at GDD centers include laboratory-

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<sup>1</sup>In this report, all years cited are fiscal years, unless otherwise noted.

<sup>2</sup>This amount does not include U.S. agency obligations to build surveillance capacity for specific diseases, namely polio, malaria, tuberculosis, avian influenza, and HIV/AIDS.

<sup>3</sup>China, Egypt, Guatemala, Kenya, and Thailand.



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strengthening efforts in Kenya and Thailand and long-term and short-term programs providing epidemiology training.

- *FETPs*. CDC and USAID obligated approximately \$19 million to support 2-year training programs, in collaboration with host-country governments, aimed at building infectious disease surveillance capacity in 24 countries. In 2004-2006, the programs trained approximately 351 epidemiologists and laboratorians.
- *IDSR*. USAID obligated approximately \$12 million, transferring about one-quarter of this amount to CDC through interagency agreements and participating agency service agreements, to support CDC and WHO's Regional Office for Africa (WHO/AFRO) in designing and implementing IDSR in 46 countries in the African region, with additional technical assistance to 8 African countries. The program's goal is to integrate countries' existing disease-specific surveillance and response systems and link surveillance, laboratory confirmation, and other data to public health actions. CDC's activities included, among others, evaluating the quality of laboratories, developing a district-level training guide (published in English and French) for analyzing surveillance data, and developing job aids for laboratories to train personnel in specimen-collection methods.
- *GEIS*. For 2005-2006,<sup>4</sup> DOD obligated approximately \$8 million through GEIS to more than 60 projects for infectious disease surveillance that helped build capacity in five developing countries where the department has overseas research laboratories. Many of the GEIS projects are conducted jointly with host-country nationals. The primary goal of the GEIS program is conducting surveillance of infectious diseases abroad to protect military health and readiness; capacity building occurs through its surveillance activities that focus on this goal. GEIS activities include, for example, establishing laboratories in host countries, training host-country staff in surveillance techniques, and providing advanced diagnostic equipment.
- *Additional activities*. USAID's Bureau for Global Health and USAID missions obligated about \$14 million in 2004-2006 for a number of additional activities that support the agency's strategy to build infectious disease surveillance capacity. The missions have supported activities such as a WHO-India effort to assist the government of India in strengthening disease surveillance—including building laboratory

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<sup>4</sup>Prior to 2005, GEIS funded the overseas laboratories directly, without a project-by-project breakdown.

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capacity, developing tools for monitoring and evaluation, and creating operational manuals for disease surveillance—and training public health personnel in epidemiological surveillance in yellow and dengue fever in Bolivia.

To limit duplication and leverage resources in countries where some or all of the capacity-building programs operate, CDC, DOD, and USAID coordinate their efforts by colocating activities, detailing staff to each other's programs, participating in various working group meetings, and communicating by phone.

The U.S. agencies monitor activities for the four key surveillance capacity-building programs, and CDC and USAID recently developed frameworks linking these activities to program goals in order to systematically measure their programs' impact on disease surveillance capacity. The three agencies monitor activities such as the number of epidemiologists trained, the number of outbreak investigations conducted, and development of laboratory diagnostic capabilities. In addition, CDC and USAID recently developed frameworks to evaluate their capacity-building programs. For example, CDC developed frameworks in 2006 for evaluating both the FETP and GDD efforts. However, because no evaluations had been completed as of July 2007, it is too early to assess whether these monitoring and evaluation efforts will demonstrate progress in building surveillance capacity. DOD does not plan to evaluate the GEIS program's impact on host countries' surveillance capacity, because it does not consider capacity building to be a primary program goal.

DOD, HHS, and USAID provided written comments on a draft of this report, generally concurring with our findings. DOD provided information to clarify the extent of GEIS's global involvement, goals, and priorities. HHS provided additional information regarding GDD operations, noting that the GDD centers bring together CDC's existing international expertise in public health surveillance, training, and laboratory methods. Additionally, HHS indicated that disease-specific programs contribute to building surveillance capacity. USAID's comments also focused mainly on the support it provides to disease-specific and other activities that contribute to building surveillance capacity.

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## Background

Dramatic growth in the volume and speed of international travel and trade in recent years have increased opportunities for diseases to spread across international boundaries. The potential threat of bioterrorism and the emergence of previously unknown diseases, such as Ebola hemorrhagic fever and SARS, as well as the development of strains resistant to

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antimicrobial drugs,<sup>5</sup> such as multidrug-resistant tuberculosis, further complicate international disease control efforts. The U.S. government's reaction to the recent case of a U.S. citizen with multidrug-resistant tuberculosis boarding several planes, crossing a number of international borders, and entering several countries illustrates the government's increasing concern regarding the spread of infectious disease. Moreover, the global reach of avian influenza—spread by birds and sometimes infecting humans—is now confirmed, with human outbreaks in 12 countries throughout Southeast Asia, the Middle East, and Africa as of 2007. The spread of infectious diseases also has economic consequences: for instance, in 2004, the SARS crisis cost Asian economies from \$11 billion to \$18 billion.<sup>6</sup>

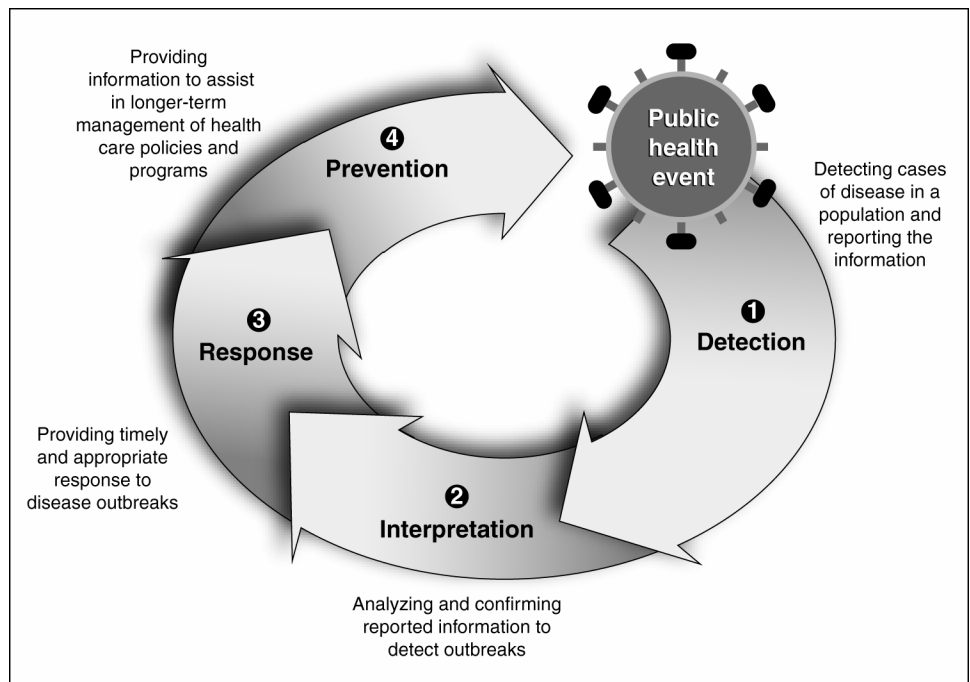
Surveillance provides essential information for action against infectious disease threats. Basic surveillance involves four functions: (1) detecting cases of disease in a population and reporting the information, (2) analyzing and confirming reported information to detect outbreaks, (3) providing timely and appropriate response to disease outbreaks, and (4) providing information to assist in longer-term management of health care policies and programs. (See fig. 1.)

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<sup>5</sup>Disease strains resistant to antimicrobial drugs are the result of excessive, uncontrolled use of these drugs.

<sup>6</sup>GAO, *Emerging Infectious Diseases: Asian SARS Outbreak Challenged International and National Responses*, [GAO-04-564](#) (Washington, D.C.: Apr. 28, 2004).

**Figure 1: Elements of a Disease Surveillance System**



Source: GAO analysis.

Disease surveillance is commonly performed through passive surveillance or active surveillance. In a passive surveillance system, national or district-level authorities prepare a list of “notifiable” diseases and guidelines for their diagnosis and then rely on local health care providers to detect and report cases of these diseases. In the United States, more than 50 diseases are considered notifiable at the national level. In an active surveillance system, health workers canvass the population, seeking possible cases of notifiable diseases. For example, active surveillance has been a prominent feature of the international campaign to eradicate polio. For both passive surveillance and active surveillance systems, public health officials at the district, national, and, sometimes, international levels aggregate and conduct epidemiological analyses of the collected data, looking for trends and examining how diseases may be clustered in certain locations or certain groups of people, to determine if an outbreak is occurring that requires a response. For greater accuracy, public health officials often require laboratory analysis of a disease to confirm or clarify initial diagnoses made by individual health care providers and to initiate a relevant and appropriate response. This is particularly important in developing countries, where local diagnostic capacity is often quite limited.

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Global efforts to improve disease surveillance have historically focused on specific diseases or groups of diseases. We previously found that the international community had set up surveillance systems for smallpox, polio, influenza, HIV/AIDS, tuberculosis, and malaria, among others, with the goal of eradicating (in the case of smallpox and polio) or controlling these diseases.<sup>7</sup> More recently, in 2005-2006, USAID planned \$15 million in funding for surveillance of pandemic strains of influenza in humans. These disease-specific efforts can build capacity for surveillance of additional diseases as well; a study of the polio eradication initiative in Africa found that at least 25 countries expanded their polio surveillance systems to include additional diseases, such as measles, neonatal tetanus, cholera, meningitis, and yellow fever.<sup>8</sup> But surveillance for diseases not targeted on a specific list is weaker than disease-specific surveillance, leaving populations potentially vulnerable to emerging, previously unknown infections.<sup>9</sup> For instance, disease experts believe that decades before WHO called for worldwide surveillance of HIV/AIDS in 1981, the virus was appearing, unrecognized and undetected, in humans.

The United States acknowledged the need to improve global surveillance and response for emerging infectious diseases in 1996, when the President determined that the national and international system of infectious disease surveillance, prevention, and response was inadequate to protect the health of U.S. citizens. Addressing these shortcomings, the 1996 Presidential Decision Directive NSTC-7 enumerated the roles of U.S. agencies—including CDC, USAID, and DOD—in contributing to global infectious disease surveillance, prevention, and response. In 2003, the National Academy of Sciences emphasized the role of building capacity for disease surveillance in other countries, recommending that “the United States should seek to enhance the global capacity for response to infectious disease threats, focusing in particular on threats in the developing world.” Among the critical deficiencies the report documented

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<sup>7</sup>GAO, *Global Health: Challenges in Improving Infectious Disease Surveillance Systems*, GAO-01-722 (Washington, D.C.: Aug. 31, 2001).

<sup>8</sup>Peter Nsubuga et al., “Polio Eradication Initiative in Africa: Influence on Other Infectious Disease Surveillance Development,” *BMC Public Health*, vol. 2 no. 27 (2002) <http://www.biomedcentral.com/1471-2458/2/27> (downloaded July 30, 2007).

<sup>9</sup>Emerging infections are “infections that have newly appeared in a population or have existed previously but are rapidly increasing in incidence or geographic range.” See S.S. Morse, “Factors in the Emergence of Infectious Diseases,” *Journal of Emerging Infectious Diseases*, vol. 1 no. 1 (1995): 7-15.

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was the need to strengthen national and regional technical capacities for infectious disease surveillance.<sup>10</sup>

Enhancing capacity for detecting and responding to emerging infectious disease outbreaks is also a key focus of the revised International Health Regulations (IHR). For many years, the IHR required reporting of three diseases—cholera, plague, and yellow fever—and delineated measures that countries could take to protect themselves against outbreaks of these diseases. In May 2005, the members of WHO revised the IHR, committing themselves to developing core capacities for detecting, investigating, and responding to other diseases of international importance, including outbreaks that have the potential to spread. The regulations entered into force in June 2007; member states are required to assess their national capacities by 2009 and comply with the revised IHR by 2012.<sup>11</sup>

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## Four Programs Support Capacity Building for Overseas Surveillance of Infectious Diseases

U.S. agencies operate or support four key programs aimed at building overseas surveillance capacity for infectious diseases. In 2004-2006, the agencies obligated approximately \$84 million for these programs in developing countries around the world. GDD is CDC's main effort to build public health capacity for infectious disease surveillance in developing countries. FETPs, which CDC and USAID support, are used to build infectious disease surveillance capacity worldwide. Additionally, USAID supports CDC and WHO/AFRO in designing and implementing IDSR in 46 countries in the African region with additional technical assistance to 8 countries. DOD's GEIS also contributes to capacity building through projects undertaken at DOD overseas research laboratories. USAID supports additional capacity-building projects in various developing countries. To limit duplication, the agencies responsible for the various programs coordinate their overseas efforts.

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<sup>10</sup>See Institute of Medicine, *Microbial Threats to Health: Emergence, Detection, and Response* (Washington, D.C.: National Academies Press, 2003).

<sup>11</sup>The revised regulations specify that each state party shall assess its systems within 2 years of the regulations entering into force on June 15, 2007. They also specify that each state party shall develop systems that meet the new requirements as soon as possible, but no later than 5 years from the date the regulations enter into force. In certain circumstances, the revised regulations allow countries to request an extension of up to 4 years to develop systems that meet the requirements.

## U.S. Obligations to Build Capacity for Infectious Disease Surveillance

In 2004-2006, the U.S. government obligated about \$84 million for programs and activities to build capacity for surveillance of infectious diseases in developing countries (see table 1). Funding for the four key programs supports the ability of laboratories to confirm diagnosis of disease as well as the training of public health professionals who will work in their countries to improve capacity to detect, confirm, and respond to the outbreak of infectious diseases.

**Table 1: U.S. Obligations for Programs Supporting Capacity Building for Infectious Disease Surveillance, 2004-2006**

Dollars in millions						
Program	Agency	Obligations				
		2004	2005	2006	Amounts provided only as 2004-2006 aggregates	Total
GDD	CDC	\$6	\$11	\$14		<b>\$31</b>
FETP	CDC <sup>a</sup>	2	2	3		<b>\$7</b>
	USAID	2	3	1	\$6	<b>\$12</b>
IDSR <sup>b</sup>	USAID <sup>c</sup>	3	3	2	4	<b>\$12</b>
GEIS	DOD	NA <sup>d</sup>	5	3		<b>\$8</b>
Additional capacity-building activities <sup>e</sup>	USAID	4	4	2	4	<b>\$14</b>
<b>Total</b>		<b>\$17</b>	<b>\$28</b>	<b>\$25</b>	<b>\$14</b>	<b>\$84</b>

Sources: GAO analysis of CDC data, USAID grant awards, DOD project reports.

Note: There are two main limitations to the reliability of these data. First, the agencies do not track capacity building in their budget systems, and therefore we developed a methodology to identify activities that involved capacity building. The agencies concurred with this methodology and its results. Second, more than half (56 percent) of the \$38 million identified as USAID obligations—about 25 percent of total identified obligations—are self-reported estimates by some of the USAID missions and bureaus. We were able to verify the remaining obligations, including obligations from other USAID missions, with documentation, and we determined that the data are sufficiently reliable. For additional information on data reliability, see app. I.

<sup>a</sup>CDC also received approximately \$2 million from non-U.S. government sources such as private foundations and the World Bank to assist with establishing FETPs. CDC treats these funds as core funds supporting its operations; however, we did not include them in our analysis, because they are not U.S.-appropriated funds.

<sup>b</sup>CDC received funds from the United Nations Foundation to support its work with IDSR. We did not include these funds in our analysis, because they are not U.S.-appropriated funds.

<sup>c</sup>USAID provides funding to CDC to support IDSR efforts.

<sup>d</sup>NA = not applicable. DOD's project reporting system was not in place until 2005.

<sup>e</sup>Additional capacity-building activities include projects supported by USAID's missions in country. This amount does not include obligations from USAID's Egypt mission, which conducted capacity-building activities for infectious disease surveillance from 2004 through 2006 but was not able to determine specifically how much funding went to these activities.

Collectively, these four programs operate in 26 developing countries. (See fig. 2.)

**Figure 2: Countries with GDD-, FETP-, IDSR-, or GEIS-Related Activities Supported by U.S. Agencies, 2004-2006**



Sources: GAO; Map Resources (map clip art).

<sup>a</sup>Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, and Panama participated in the Central America FETP in 2004-2006.

<sup>b</sup>Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan participated in the Central Asia FETP in 2004-2006.

<sup>c</sup>CDC and USAID provided direct assistance to these countries in implementing WHO/AFRO's IDSR; in addition, WHO/AFRO is working with other countries in Africa to implement IDSR.

<sup>d</sup>CDC support for IDSR implementation in Guinea and southern Sudan was funded by the United Nations Foundation.

## Global Disease Detection

CDC obligated about \$31 million for GDD capacity-building activities in 2004-2006. According to CDC, GDD is its primary effort to build public



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health capacity to detect and respond to existing and emerging infectious diseases in developing countries.<sup>12</sup> GDD's goals are to

- enhance surveillance,
- conduct research,
- respond to outbreaks,
- facilitate networking, and
- train epidemiologists and laboratorians.

GDD, established in 2004, aims to set up a total of 18 international centers<sup>13</sup> that would collaborate with partner countries, surrounding regions, and WHO to support epidemiology training programs and national laboratories and conduct research and outbreak response around the world. Five GDD centers already exist: 2 were established in Kenya and Thailand in 2004,<sup>14</sup> and 3 more are currently under development in Egypt, China, and Guatemala.<sup>15</sup> In addition, CDC established a GDD Operations Center in Atlanta to coordinate information related to potential outbreaks.<sup>16</sup> Funds that CDC obligated for GDD have been used for capacity building as well as for conducting outbreak response, research, and networking.

According to CDC officials, GDD capacity-building activities include laboratory-strengthening efforts in countries where GDD centers are

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<sup>12</sup>In developing GDD, CDC drew on its existing international expertise in public health surveillance, training, and laboratory methods and brought together three previously established programs: FETP, the International Emerging Infections Program (IEIP), and influenza activities.

<sup>13</sup>CDC officials told us that the GDD centers are typically incorporated into ministry of health facilities or colocated with universities.

<sup>14</sup>The Thailand center incorporated an IEIP, which is a program for research and outbreak response to emerging infectious diseases.

<sup>15</sup>The long-term applied epidemiology training program in Guatemala is referred to as the Central America FETP.

<sup>16</sup>The outbreak center receives information from the GDD centers, as well as from other entities that collect and disseminate reports on disease outbreaks, such as the Global Public Health Intelligence Network, Epidemic Information Exchange, ProMED Mail, DOD, the intelligence community, and the Department of State.

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located, long-term and short-term activities providing epidemiology training,<sup>17</sup> and participation in surveillance activities.

- *Laboratory-strengthening efforts.* Efforts to build laboratory capacity in Kenya and Thailand have focused on establishing laboratories<sup>18</sup> with advanced diagnostic capabilities, which can be used to support outbreak investigations and facilitate training. For example, in Kenya, CDC established biosafety level 2 and 3 laboratories in Nairobi and a biosafety level 2 laboratory in Kisumu.<sup>19</sup> Supporting the need for specialized training in Thailand, CDC, in collaboration with WHO's Southeast Asia Regional Office and the Thai Ministry of Health, conducted a workshop focused on diagnosing, treating, and preventing exposure to anthrax.
- *Epidemiology training programs and activities.* Training at the GDD centers occurs formally through long-term applied epidemiology training programs<sup>20</sup> and informally through the participation of host-country nationals in short-term activities focused on outbreak response, surveillance, and research.
- *Long-term programs.* Trainees in the formal, 2-year epidemiology training programs<sup>21</sup> get hands-on experience in analyzing data, responding to outbreaks, and working on research projects that provide capacity-building opportunities through experience-based training. Graduates of these programs are counted under the FETPs.

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<sup>17</sup>GDD centers also receive supplemental avian and pandemic influenza funding from the Department of Health and Human Services (HHS). As of December 2006, HHS received planned funding of \$150 million for avian influenza-related activities, some of which was used by the GDD centers to conduct rapid-response training for the disease. The skills acquired during these training sessions can be applied to detecting and investigating other diseases.

<sup>18</sup>CDC officials told us that these efforts generally support national and district-level public health laboratories.

<sup>19</sup>Biosafety addresses the safe handling and containment of infectious microorganisms and hazardous biological materials. Levels of containment range from 1 (lowest) to 4 (highest) and depend on the risk of infection, severity of disease, likelihood of transmission, nature of work being conducted, and origin of the infectious disease agent.

<sup>20</sup>These long-term programs are FETPs that existed prior to the establishment of the GDD centers and are now operating as part of the centers. The FETPs in GDD countries are implemented and supported by CDC in a manner similar to the FETPs in non-GDD countries.

<sup>21</sup>The programs typically include both classroom training as well as on-the-job training in conducting surveillance and outbreak investigations. CDC officials told us that classes are held variously in local universities or in ministry of health facilities.

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- *Short-term activities.* Host-country nationals participated in short-term GDD training activities. For example, in 2006, GDD centers trained 230 participants from 32 countries to respond to pandemics and trained 90 staff to diagnose avian influenza. Also in 2006, host-country nationals, in collaboration with CDC, responded to more than 144 outbreaks in China, Kenya, and Thailand. CDC officials told us that these collaborative efforts build capacity as host-country nationals work alongside CDC experts, learning new methods and techniques that can later be applied to future emerging diseases.

*Surveillance activities.* Host-country nationals work with CDC to evaluate existing surveillance systems, develop new surveillance systems, write and revise peer-reviewed publications, and use surveillance data to inform policy decisions. For example, in 2002, CDC and Thai officials evaluated rural Thailand's pneumonia surveillance system. Through this effort, Thai health officials were involved in the collection of data related to the existing passive surveillance system, which demonstrated weaknesses in the training of personnel, the lack of a standard case definition, and an underreporting of deaths.

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## Field Epidemiology Training Programs

With assistance from USAID and WHO, and at the request of national governments, CDC has helped countries establish their own FETPs to strengthen their public health systems by training epidemiologists and laboratorians in infectious disease surveillance.<sup>22</sup> CDC and USAID obligated approximately \$19 million to support these programs in 2004-2006. Each FETP is customized in collaboration with country health officials to meet the country's specific needs. The programs emphasize

- applied epidemiology and evidence-based decision making for public health actions;
- effective communication with the public, public health professionals, and the community; and
- health program design, management, and evaluation.

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<sup>22</sup>The FETP model is based on CDC's Epidemic Intelligence Service, which began in 1951. In addition to the FETPs, there are also three Field Epidemiology and Laboratory Training Programs in Kenya, Pakistan, and South Africa. These are included in our discussion of FETPs.

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CDC and USAID collaborate with host-country ministries of health in Brazil, Central America,<sup>23</sup> Central Asia,<sup>24</sup> China, Egypt, Ghana, India, Jordan, Kenya, Pakistan, South Africa, Sudan,<sup>25</sup> Thailand, Uganda, and Zimbabwe<sup>26</sup> to build surveillance capacity through the FETPs. In addition to receiving formal classroom training in university settings, FETP students and graduates participate in surveillance and outbreak response activities, such as analyzing surveillance data, performing economic analysis, and describing health problems and initiating actions. They also publish articles in peer-reviewed bulletins and scientific journals. At the end of the 2-year program, which includes both classroom and on-the-job training in applied epidemiology and laboratory science, participants receive a postgraduate diploma or certificate.

According to CDC, these programs graduated 351 epidemiologists and laboratorians in 2004-2006. As of February 2007, CDC reported, six programs established in 1999-2004<sup>27</sup> tracked their graduates and found that approximately 92 percent continued to work in the public health arena after the training. For example, in Jordan, 21 of 23 FETP graduates are working as epidemiologists at the central and governorate levels, and graduates from Brazil's FETP hold supervisory and staff epidemiology positions at the Ministry of Health.

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## Integrated Disease Surveillance and Response

USAID has supported CDC and WHO/AFRO in designing and implementing IDSR in 46 African countries and providing technical assistance to 8 of these countries. USAID obligated approximately \$12 million in 2004-2006 to support IDSR, transferring about one-quarter of this amount to CDC through interagency agreements and participating agency service agreements. IDSR's goal is to utilize limited public health

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<sup>23</sup>In 2004-2006, the Central America FETP, based in Guatemala, trained students from Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, and Panama. Panama's participation is funded by CDC's Global AIDS Program.

<sup>24</sup>Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan participated in the Central Asia FETP in 2004-2006.

<sup>25</sup>CDC supports an advisor for the Sudan program, but the students receive their training in the Kenya program.

<sup>26</sup>The programs in Ghana, Uganda, and Zimbabwe are Public Health Schools without Walls (PHSWOW). This program was established by the Rockefeller Foundation and is another type of applied epidemiology training program. CDC supported the PHSWOWs in these three countries through the Global Surveillance Project, funded by USAID.

<sup>27</sup>The six programs are in Brazil, Central Asia, Central America, India, Jordan, and Kenya.

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resources effectively by integrating the multiple disease-specific surveillance and response systems that exist in these countries and linking surveillance, laboratory confirmation, and other data to public health actions.<sup>28</sup>

CDC has collaborated with WHO/AFRO in developing tools and guidelines, which WHO/AFRO then disseminates for widespread use in the region to improve surveillance and response systems. CDC's assistance has included

- developing an assessment tool to determine the status of surveillance systems throughout Africa,
- developing technical guidelines for implementing IDSR,
- working to strengthen the national public health surveillance laboratory systems, and
- conducting evaluations of the cost to implement IDSR in several African countries.

In addition, CDC is providing technical assistance to eight countries in Africa,<sup>29</sup> which CDC and USAID selected as likely to become early adopters of surveillance best practices and therefore to be models for other countries in the region. With funding from USAID, CDC has undertaken activities in these countries such as evaluating the quality of national public health laboratories in conjunction with WHO, developing a district-level training guide (published in English and French) for analyzing surveillance data, and developing job aids for laboratories to train personnel in specimen-collection methods.

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## Global Emerging Infections Surveillance and Response System

DOD established GEIS in response to the 1996 Presidential Decision Directive NSTC-7 on emerging infectious diseases, which called on DOD to support global surveillance, training, research, and response to infectious disease threats. In 2004-2006, DOD obligated approximately \$8 million through GEIS to build capacity for infectious disease surveillance. GEIS, as part of its mission, provides funding to the five DOD overseas research

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<sup>28</sup>According to CDC, WHO/AFRO is also working through IDSR to improve African countries' abilities to meet the requirements of the revised IHR.

<sup>29</sup>CDC and USAID have supported the implementation of IDSR in Burkina Faso, Ethiopia, Ghana, Kenya, Mali, Tanzania, Uganda, and Zimbabwe. In addition, CDC has supported the implementation of IDSR in Guinea and southern Sudan, funded by the United Nations Foundation.

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laboratories in Egypt, Indonesia, Kenya, Peru, and Thailand,<sup>30</sup> as well as other military research units, for specific surveillance projects. DOD officials told us that these projects are located in 36 countries. GEIS officials view its primary goal as providing surveillance to protect the health of U.S. military forces and consider capacity building a secondary goal that occurs as a result of surveillance efforts.

Although capacity building is not GEIS's primary goal, it conducts many projects jointly with host-country nationals, providing opportunities to build capacity through their participation in disease surveillance projects. GEIS funded more than 60 capacity-building projects in 2005 and 2006,<sup>31</sup> supporting activities such as establishing laboratories in host countries, training host-country staff in surveillance techniques, and providing advanced diagnostic equipment. For example, in Nepal, GEIS funded surveillance of febrile illnesses, such as dengue fever, and through this project provided a field laboratory with training and equipment to conduct advanced diagnostic techniques. According to DOD, this effort, along with several other projects at the site, transformed the laboratory from a facility for shipping specimens into a fully functional infectious disease surveillance laboratory. In Egypt, GEIS funded a surveillance system for the rotavirus, the most common cause of severe diarrhea among children. As part of this effort, clinicians and laboratorians in Libya, Bahrain, Jordan, Sudan, Syria, and Yemen were trained in conducting surveillance for this disease. GEIS has also funded more direct training; for example, the laboratory in Peru conducted an outbreak-investigation training course for public health officials from Peru, Argentina, Chile, and Suriname in 2006 with GEIS funding.

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### Additional Activities Supporting Capacity Building

Funding provided by USAID's Bureau for Global Health and USAID missions has supported additional activities to build basic epidemiological skills in developing country health personnel. In 2004-2006, USAID obligated about \$14 million for these activities. These activities include, for example, a WHO laboratory quality control effort in WHO's Africa and Eastern Mediterranean regions; a WHO-India effort to assist the government of India in improving disease surveillance, including

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<sup>30</sup>The laboratories are under the command of the U.S. Army in Kenya and Thailand and the U.S. Navy in Egypt, Indonesia, and Peru.

<sup>31</sup>A breakdown of individual project data is not available prior to 2005, which is when GEIS began awarding funding for individual projects to the DOD overseas laboratories. Prior to that, GEIS obligated a fixed amount to each laboratory.

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strengthening laboratories, developing tools for monitoring and evaluating surveillance efforts, and creating operational manuals for disease surveillance; and training for public health personnel in epidemiological surveillance in yellow and dengue fever in Bolivia.

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## Interagency Coordination of Overseas Efforts

To limit duplication and leverage resources in countries where some or all of the capacity-building programs operate, CDC, DOD, and USAID coordinate their efforts by colocating activities, detailing staff to each other's programs, participating in working groups, and communicating by phone.<sup>32</sup>

- *Colocation.* CDC and DOD have colocated some programs to enhance coordination and communication and to facilitate information and resource sharing. For instance, CDC's GDD is colocated with DOD's research laboratory in Egypt, and CDC and DOD efforts are also colocated in Kenya.
- *Staff details.* CDC has detailed staff to DOD facilities overseas—for example, in Peru and Cambodia—and both agencies have detailed staff to WHO in Geneva. Detailees provide technical assistance and facilitate information sharing, both between and within their own agencies, about activities to build infectious disease surveillance capacity.
- *Working groups.* U.S. agencies also share information by participating in working groups focused on issues such as pandemic influenza. For example, CDC has participated in DOD's influenza working group for South East Asia since 2005. Topics discussed at these meetings include interagency collaboration and preventing overlap in the agencies' pandemic surveillance efforts. Likewise, representatives of USAID and CDC meet regularly to plan and define their appropriate roles and responsibilities, coordinate their approach to IDSR in Africa, and support FETP and the African Field Epidemiology Network.
- *Phone communication.* USAID and CDC share information regularly by phone to ensure coordination of activities and achievement of common goals.

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<sup>32</sup>GAO has identified eight practices that agencies can use to enhance and sustain their collaborative efforts, including developing mechanisms to monitor, evaluate, and report on them. See GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration among Federal Agencies*, [GAO-06-15](#) (Washington, D.C.: Oct. 21, 2005).

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## Agencies Monitor Surveillance Capacity-Building Activities, and CDC and USAID Have Begun Efforts to Evaluate Programs' Impact

For each of the four key surveillance capacity-building programs they support, U.S. agencies monitor activities by, for example, tracking the number of epidemiologists trained, the number of outbreak investigations conducted, and types of laboratory training completed. In addition, CDC and USAID recently began systematic efforts to evaluate the impact of their programs; however, because no evaluations had been completed as of July 2007, it is too early to assess whether the evaluations will demonstrate progress in building surveillance capacity.

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### Agencies Monitor Program Activities

CDC, DOD, and USAID collect data on activities in the four surveillance capacity-building programs. For example:

- *GDD*. Since 2006, CDC has monitored the number of outbreaks that GDD has investigated, the numbers of participants in GDD short-term and long-term training, and examples of collaboration among GDD country programs. (See app. II for more information on GDD activities.)
- *FETP*. CDC has monitored the numbers of FETP trainees and graduates, the numbers of FETP graduates hired by public health ministries, the number of graduates' journal articles in peer-reviewed publications, graduates' participation in international scientific meetings, the number of outbreak investigations conducted, and the number of surveillance evaluations conducted. (See app. III for more information on FETP activities.)
- *IDSR*. Since 2000, CDC has collected data on activities completed under its IDSR assistance program, including the number of job aids developed, the training materials adopted, and the number of training courses completed, and it reports on these activities annually to USAID. (See app. IV for more information on IDSR activities.)
- *GEIS*. Since 2005, DOD has monitored GEIS capacity-building activities through individual project reports that detail each activity completed, such as training for staff involved in surveillance studies and development of laboratory diagnostic capabilities. (See app. V for more information on GEIS activities.)

In addition, USAID has monitored programs or projects supported by its missions through reports describing completed activities.



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## CDC and USAID Have Begun Efforts to Evaluate Impact of Surveillance Capacity-Building Programs

CDC and USAID recently began developing frameworks for systematically evaluating the impact of GDD, FETP, and IDSR on countries' surveillance capacity. However, the agencies have not yet collected sufficient information to evaluate the programs' contribution to improved surveillance. DOD does not plan to evaluate its capacity-building efforts, because it does not view surveillance capacity building in host countries as a primary goal of GEIS.

- *GDD*. In 2006, the first year of GDD center operations, CDC developed an evaluation framework that includes indicators for each of GDD's five goals.<sup>33</sup> For example, for training, indicators include the number of graduates of long-term training programs, number of participants in short-term training programs, and number and proportion of trained graduates who hold public health leadership positions. (See fig. 3.) CDC collects data for these indicators while monitoring GDD activities.<sup>34</sup> After finalizing the framework, CDC plans to evaluate all GDD centers against these performance measures and indicators. This will enable comparisons between centers and assessments of the centers' capabilities and is intended to evaluate progress toward intended outcomes, including building surveillance capacity. CDC collected data in 2006 for 8 of the 14 indicators but, as of July 2007, had not collected data on the two surveillance indicators to evaluate the program's contribution to improved surveillance.

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<sup>33</sup>GDD's five goals are surveillance, research, outbreak response, networking, and training.

<sup>34</sup>Because CDC's and USAID's evaluation frameworks are under development or in early implementation, we did not assess the adequacy of these efforts to demonstrate progress in building surveillance capacity.

**Figure 3: Framework for Evaluating Impact of GDD**

Outbreak investigation and response	Surveillance	Research	Training	Networking and communications
Number and proportion of outbreaks of priority conditions that are investigated with GDD response center assistance	Number and proportion of priority diseases for which population-based incidence can be monitored over time	Number of peer-reviewed articles published	Number of graduates from long-term training programs or participants in short-term training programs	Number of collaborations between response centers
Number and proportion of GDD outbreak investigations for which laboratory analysis yielded a confirmed cause	Proportion of laboratory samples collected through surveillance activities submitted for laboratory analysis that were successfully processed and reported	Number of presentations (oral or poster) at international scientific meetings	Number and proportion of trained graduates who hold public health leadership positions	Improvements in standardization of surveillance systems and training approaches across response centers
Timeliness of response to outbreaks of priority conditions		Number of new pathogens described		Timeliness of reporting of outbreaks of priority conditions to GDD Operations Center
Timeliness of specimen shipment between GDD response center and Atlanta				

Source: Centers for Disease Control and Prevention.

- FETP*. In 2006, CDC developed a framework for monitoring and evaluating FETPs' impact on countries' health systems by measuring 13 indicators related to FETP activities.<sup>35</sup> Some of these indicators measure a specific activity, such as the number of graduates, while others focus more on program impact, such as whether a country's surveillance system was improved or expanded by an FETP or its trainees. (Fig. 4 shows the relevant FETP indicators.) Prior to developing its formal monitoring and evaluation system, CDC collected information on program activities but did not systematically evaluate the impact of FETPs on improving surveillance capacity. CDC hopes to implement the framework fully by 2009, but this depends on country cooperation; because FETPs are collaborations between CDC and the host countries, CDC's FETP handbook presents the framework as guidance to the countries rather than as a requirement. In addition to establishing program indicators, CDC developed a database, which it is

<sup>35</sup>CDC sought input on the indicators from USAID, FETPs, and members of the Training Programs in Epidemiology and Public Health Intervention Network, a professional alliance of FETPs located in 32 countries around the world. In total there are 21 indicators; however, some of them are related to the process of institutionalizing the program in country.

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sharing with FETP countries, for collecting and evaluating data for the indicators.<sup>36</sup>

**Figure 4: Indicators for Evaluating Impact of FETPs**

- Number of graduates
- Number of investigations of acute health events
- Planned studies conducted
- Surveillance systems data analyzed and used
- Local/regional dissemination of trainee/officer and program work
- Presentations to international scientific conferences
- Peer-reviewed publications
- Strengthened public health workforce
- Surveillance system improved/expanded by program and/or trainees
- Evidence-based public health action for acute health events improved/expanded by program and/or trainees
- Evidence-based public health programs/projects started because of graduates, programs, and/or trainees
- Evidence-based policies/regulations created or improved because of programs and/or trainees
- National and/or regional public health professional network of graduates

Source: Centers for Disease Control and Prevention.

- *IDSIR*. In 2003, WHO/AFRO adopted 11 indicators, developed with input from CDC and USAID, to monitor and evaluate progress in implementing IDSIR in Africa. The indicators are intended to help identify problems in implementing IDSIR, evaluate progress, and advocate for resources for IDSIR. The indicators also enable comparisons across countries. (See fig. 5 for a complete list of the IDSIR indicators.) According to WHO/AFRO, 19 of 46 African countries reported on at least some of these indicators in 2006. For example, 18 countries reported that an average of 79 percent of their districts filed timely surveillance reports, which indicates the speed with which surveillance information is transmitted, and 16 countries reported that an average of 78 percent of outbreaks were confirmed with laboratory evidence, which indicates the use of laboratories in outbreak detection, confirmation, and response. A CDC official noted that the agency prompts countries to collect data on the indicators, by inquiring during meetings with country officials whether the indicators are being used to evaluate progress. However, U.S. agencies cannot require countries to collect data on the indicators, because IDSIR is a country-owned program. In addition to the ongoing collection of data for these 11 indicators, WHO/AFRO conducts, in conjunction with the countries,

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<sup>36</sup>The database is called Epi-Track.

periodic in-depth assessments of country progress in IDSR implementation.<sup>37</sup> CDC also completed an evaluation in 2005 of the implementation of IDSR in Ghana, Tanzania, Uganda, and Zimbabwe and, using a set of 40 indicators based on WHO guidance,<sup>38</sup> found that these countries had implemented most of the elements of IDSR. Although the results of CDC's evaluation effort were positive, the effort represents only 4 of the 8 countries that CDC is assisting directly in implementing IDSR.

**Figure 5: Indicators for Evaluating Impact of IDSR**

- Proportion of health facilities submitting weekly or monthly surveillance reports on time to the district level
- Proportion of districts submitting weekly or monthly surveillance reports on time to the next higher level
- Proportion of cases of diseases targeted for elimination or eradication and any other diseases selected for case-based surveillance, which were reported to the district using case-based or line listing forms
- Proportion of suspected outbreaks of epidemic-prone diseases notified to the next higher level within 2 days of passing the epidemic threshold
- Proportion of districts with current trend analysis (line graphs) for selected diseases
- Proportion of reports of investigated outbreaks that include analyzed case-based data
- Proportion of investigated outbreaks with laboratory results
- Proportion of confirmed outbreaks with a nationally recommended public health response
- Case fatality rates for outbreaks of priority diseases
- Attack rates for outbreaks of epidemic-prone diseases
- Proportion of epidemics detected at regional and national levels through analysis of surveillance data from districts and that were missed by the district level

Source: World Health Organization.

- *GEIS*. According to GEIS officials, DOD does not plan to develop a framework to monitor and evaluate the impact of GEIS on countries' surveillance capacity, because capacity building in host countries is not GEIS's primary purpose. Rather, GEIS's goal is to establish effective infectious disease surveillance and detection systems with the ultimate aim of ensuring the health of U.S. forces abroad. However, DOD reviewed two GEIS surveillance projects and found that they resulted in improvements in disease surveillance.<sup>39</sup> GEIS officials asserted that

<sup>37</sup>For example, assessments have been completed in the Gambia, Ethiopia, Malawi, and Uganda.

<sup>38</sup>World Health Organization, *Protocol for the Assessment of National Communicable Disease Surveillance and Response Systems: Guidelines for Assessment Teams*, WHO/CDS/CSR/ISR/2001.2 (Geneva: 2001).

<sup>39</sup>In addition, the Institute of Medicine (IOM) completed a review of the GEIS program in 2001, and DOD officials told us that IOM was nearing completion of a second evaluation of GEIS's pandemic influenza activities as of September 2007.

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the program's activities in the host nations have led to improved surveillance capacity for infectious diseases. For example, according to these officials, GEIS helped to establish an electronic surveillance system in Indonesia, Laos, Cambodia, and Vietnam, as well as another version of the system in Peru, that improved timely detection of, and response to, infectious disease epidemics.

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## Agency Comments and Our Evaluation

DOD, HHS, and USAID provided written comments on a draft of this report, generally concurring with our findings. We have reprinted these comments in appendixes VI, VII, and VIII and incorporated the agencies' technical comments as appropriate.

DOD clarified the extent of GEIS's global involvement, noting that DOD overseas laboratories develop regional projects, which DOD refers to as programs and each of which serves many countries. We accordingly added a reference in our report to the number of countries that GEIS serves. Regarding our map's lack of inclusion of locally operated and fixed laboratories, these are small activities relative to the five DOD laboratories operating in Egypt, Kenya, Indonesia, Peru, and Thailand. For instance, the budget for the laboratory in Nepal in 2006 was \$175,000, compared with \$1,340,000 that GEIS obligated to projects at the DOD laboratory in Indonesia. DOD also clarified that although GEIS's highest priority goals are surveillance, detection, response, and readiness, its goal of capacity building is important to the success of these goals. Additionally, DOD provided information regarding evaluations of surveillance projects that GEIS has undertaken, and in response we included in the report information pertaining to GEIS program reviews.

HHS provided additional information regarding the operations of GDD, noting that the centers bring together CDC's existing international expertise in public health surveillance, training, and laboratory methods and build on three previously established programs: FETP, International Emerging Infections Program, and influenza activities. We have incorporated this information into the report. In an effort to more accurately characterize GDD's structure, we had several discussions with CDC officials, who emphasized that GDD brought these programs together. Additionally, HHS indicated that disease-specific programs contribute to capacity building. We agree that these programs contribute to capacity building, but they are outside the scope of this report. GAO has

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conducted numerous reviews on disease-specific activities, such as those for avian influenza, HIV/AIDS, and malaria.<sup>40</sup>

USAID's comments expanded on its funding for capacity-building activities specific to diseases such as avian influenza, HIV/AIDS, malaria, polio, and tuberculosis, a point that we acknowledge in the report's background. USAID also provided additional examples of capacity building. All of these activities were included in our accounting of obligations provided by USAID.

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As agreed with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 6 days from its date. At that time, we will send copies to the Secretaries of Defense and Health and Human Services, the Administrator of the U.S. Agency for International Development, appropriate congressional committees, and other interested parties. We will also make copies available to others upon request. In addition, the report will be available at no charge on GAO's Web site at <http://www.gao.gov>.

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<sup>40</sup>See GAO, *Influenza Pandemic: Efforts to Forestall Onset Are Under Way; Identifying Countries at Greatest Risk Entails Challenges*, [GAO-07-604](#) (Washington, D.C.: June 20, 2007); *Global Health: Spending Requirement Presents Challenges for Allocating Prevention Funding under the President's Emergency Plan for AIDS Relief*, [GAO-06-395](#) (Washington, D.C.: April 4, 2006); and *Global Malaria Control: U.S. and Multinational Investments and Implementation Challenges*, [GAO-06-147R](#) (Washington, D.C.: Nov. 16, 2005).

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If you or your staff have any questions regarding this report, please contact me at (202) 512-3149 or [gootnickd@gao.gov](mailto:gootnickd@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix IX.

A handwritten signature in black ink, appearing to read "David Gootnick". The signature is stylized with a large, looping initial "D" and a cursive "Gootnick".

David Gootnick  
Director  
International Affairs and Trade

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# Appendix I: Objectives, Scope, and Methodology

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We examined (1) the obligations, goals, and activities of key U.S. programs to develop epidemiology and laboratory capacity and (2) U.S. agencies' monitoring of the progress achieved by these programs.

To describe the obligations of the key U.S. programs to develop epidemiology and laboratory capacity for surveillance of infectious diseases in 2004-2006, we reviewed annual budgets for the Centers for Disease Control and Prevention's (CDC) Global Disease Detection (GDD) and International Emerging Infections Program (IEIP), the Department of Defense's (DOD) Global Emerging Infections Surveillance and Response System (GEIS), and the five Army and Navy overseas laboratories; U.S. Agency for International Development (USAID) grants to CDC and the World Health Organization (WHO) for support of Integrated Disease Surveillance and Response (IDSR) and other programs; CDC's obligations for Field Epidemiology Training Programs (FETP); and DOD's GEIS project funding reports. In addition, we interviewed USAID officials in the Africa, Asia, Eastern Europe, and Latin America bureaus to identify funding for mission activities intended to build crosscutting capacity for surveillance of infectious diseases, excluding capacity building funded by appropriations for polio, tuberculosis, malaria, HIV/AIDS, and avian influenza. We also interviewed officials at CDC, DOD, and USAID's Bureau of Global Health and regional bureaus.

To describe the goals of these programs, we examined the Presidential Decision Directive NSTC-7 on emerging infectious diseases, CDC and USAID guidance documents for combating infectious diseases abroad, strategic plans for DOD's GEIS and CDC's GDD, strategic goals for CDC's Coordinating Office of Global Health, WHO's Regional Office for Africa's (WHO/AFRO) plan for integrated disease surveillance in Africa, GEIS project objectives, and work plans for CDC's assistance to IDSR as well as for individual country FETPs.

To determine the activities of these programs, we reviewed annual reports on GEIS and CDC's Division of Epidemiology and Surveillance Capacity Development in the Coordinating Office of Global Health, CDC's and WHO's progress reports to USAID on FETPs and IDSR, GDD accomplishment reports, and project reports from DOD's GEIS. We also interviewed CDC, DOD, Department of State, USAID, and WHO officials responsible for implementing capacity-building activities, including CDC's Coordinating Office for Global Health and Coordinating Center for Infectious Diseases, as well as key personnel managing the Thailand and Kenya GDD centers. To assess coordination among the agencies and programs, we observed a GDD coordination meeting and a biweekly GDD



country team meeting at CDC and conducted interviews with agency officials at CDC, DOD, USAID, and WHO.

To learn how agencies were measuring the programs' progress in building infectious disease surveillance capacity, we analyzed reports from GDD, GEIS, FETP, IEIP, and IDSR regarding these programs' progress and accomplishments. We also reviewed frameworks for monitoring and evaluation, including quantitative measures, for GDD and FETP; reports from WHO that established measures for evaluating the success of IDSR in Africa; and annual reports and assessments of individual country FETPs, including the Epi-Track database used in some countries to monitor FETP achievements. Additionally, we interviewed officials from the respective programs and from WHO to understand how they monitored program progress.

We identified two limitations in the reliability of the data that the agencies provided. First, agencies did not track obligations for infectious disease surveillance capacity-building, and thus we developed a methodology, based on program documentation and discussions with program officials, to categorize the obligations. The methodology involved reviewing descriptions of program activities to identify whether a particular surveillance activity included capacity building and which program it supported. The agencies concurred with this methodology and the capacity-building activities we identified. Second, about 25 percent of the total obligations we identified are self-reported amounts from some of USAID's missions and bureaus. According to USAID, the self-reported obligations represent the missions' and bureaus' best estimates of how much was obligated. For the other approximately 75 percent of the obligations, we obtained documentation such as grant amendments and scopes of work to verify the obligated amounts. Based on our interviews with knowledgeable officials at USAID, and the fact that we were able to verify the majority of the obligations, we determined that the data were sufficiently reliable for our purpose of describing the agencies' obligations for the key programs we identified as well as for additional capacity-building activities for infectious disease surveillance. However, we rounded to the nearest million dollars the funding information that the agencies provided.

We conducted our work from October 2006 through July 2007 and in accordance with generally accepted government auditing standards.

# Appendix II: GDD

CDC's GDD has established five centers around the world to develop public health capacity to detect and respond to emerging infectious diseases and bioterrorist threats. Congress made its initial appropriations for the program in 2004, and GDD's first report on the centers' progress covers accomplishments for 2006. Table 2 presents an overview of activity data collected for individual GDD centers.

**Table 2: Overview of GDD Center Activity Data**

Country	Activity
China	<ul style="list-style-type: none"> <li>30 graduates from long-term epidemiology training, 2004-2006<sup>a</sup> <ul style="list-style-type: none"> <li>20 graduates in key positions in 14 provinces</li> </ul> </li> <li>100 city-level public health doctors participated in 4-day training course in surveillance and epidemiology</li> <li>Conducted 90 outbreak responses, 23 of which were human avian influenza cases</li> <li>Conducted outbreak investigation of <i>Streptococcus suis</i> that led to drop in number of cases <ul style="list-style-type: none"> <li>215 cases, 39 deaths in 2005</li> <li>Investigation indicated strict ban on pig slaughter</li> <li>In 2006, 83 percent fewer cases and zero deaths</li> </ul> </li> </ul>
Guatemala	<ul style="list-style-type: none"> <li>20 graduates from long-term epidemiology training, 2004-2006<sup>a</sup></li> <li>150 graduates of 3-month epidemiology course in Guatemala, and 192 graduates in Costa Rica</li> <li>Conducted outbreak response to methanol intoxication in Nicaragua <ul style="list-style-type: none"> <li>Over 700 cases; 41 deaths</li> <li>Identified contaminated alcohol as the cause; outbreak contained</li> </ul> </li> <li>Collaborated with local institutions to strengthen regional laboratory capacity</li> <li>Developed rapid-response capacity through workshop attended by 70 participants from eight countries in November 2006</li> <li>Synchronized community-based surveillance protocols with sites in Thailand and Kenya to enable cross-country comparison of data</li> </ul>
Egypt	<ul style="list-style-type: none"> <li>15 graduates from long-term epidemiology training, 2004-2006<sup>a</sup></li> <li>Rapid-response capacity being established through rapid response training in Cairo</li> <li>Laboratory avian influenza capacity strengthened; instituted advanced laboratory testing for bacterial meningitis and for rickettsioses</li> <li>Collaborated with Kenya GDD program to provide laboratory team and entomologist to assist with Rift Valley fever outbreak in Kenya</li> </ul>
Kenya	<ul style="list-style-type: none"> <li>7 graduates from long-term epidemiology training, 2004-2006<sup>a</sup></li> <li>Trained district health surveillance teams from eight provinces on IDSR</li> <li>Developed avian influenza training and rapid-response training capacity in Africa</li> <li>Predicted and confirmed Rift Valley fever outbreak <ul style="list-style-type: none"> <li>Fewer than 200 human cases and 50 deaths</li> <li>Containment efforts ongoing to address its spread to Somalia and Tanzania</li> </ul> </li> <li>Established previously unavailable testing for more than five pathogens <ul style="list-style-type: none"> <li>Tested 786 humans and animals for avian influenza, meningococcal meningitis, and yellow fever; provided extensive laboratory support to countries within the region</li> </ul> </li> </ul>

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Appendix II: GDD

Country	Activity
Thailand	<ul style="list-style-type: none"><li>• Collaborated with Kenya Ministry of Health and WHO to establish IDSR</li></ul>
	<ul style="list-style-type: none"><li>• 8 graduates from long-term epidemiology training, 2004-2006<sup>a</sup></li></ul>
	<ul style="list-style-type: none"><li>• 40-45 participants in field epidemiology short course in 2006</li></ul>
	<ul style="list-style-type: none"><li>• Led and hosted the model rapid response training; all five GDD centers participated</li></ul>
	<ul style="list-style-type: none"><li>• Helped build avian influenza laboratory capacity in Bangkok and in 14 Thai regions</li></ul>
	<ul style="list-style-type: none"><li>• Responded to botulism outbreak<ul style="list-style-type: none"><li>• Largest reported outbreak of botulism</li><li>• 232 cases, 45 ventilated patients</li><li>• 50 vials of antitoxin delivered within 48 hours; no deaths</li></ul></li></ul>
	<ul style="list-style-type: none"><li>• Expanded an ongoing population-based pneumonia surveillance system in two provinces by adding microbiology diagnostic capacity<ul style="list-style-type: none"><li>• Within 10 months of implementation, obtained 26 isolates of <i>Streptococcus pneumoniae</i></li></ul></li></ul>
	<ul style="list-style-type: none"><li>• Conducted regional drills with WHO, the Asian Development Bank, and other national and international partners</li></ul>

Source: CDC.

<sup>a</sup>These are graduates of the FETP.

# Appendix III: FETP

The United States assists countries in improving and strengthening their public health system and infrastructure through FETPs. The program, established in 1980,<sup>1</sup> provides 2 years of classroom instruction and field assignments.<sup>2</sup> Field assignments include conducting epidemiologic investigations and field surveys; evaluating various components of domestic surveillance systems; performing disease control and prevention measures, such as identifying risk factors associated with pulmonary tuberculosis in Kazakhstan; reporting their findings to decision makers and policymakers; training other health care workers; building professional networks through participating in international conferences; and enhancing professional stature by publishing in peer-reviewed journals. From 2004 through 2006, FETPs in 15 programs graduated 351 participants (see table 3). As of February 2007, according to CDC, six programs established from 1999 through 2004<sup>3</sup> tracked their graduates and found that 92 percent continued to work in the public health arena following the training.

**Table 3: FETP Trainees and Graduates by Country, 2004-2006**

Country/region	2004		2005		2006	
	Trainees <sup>a</sup>	Graduates	Trainees <sup>a</sup>	Graduates	Trainees <sup>a</sup>	Graduates
Brazil	11	0	25	0	24	11
Central America	53	5	45	15	29	0
Central Asia	15	0	18	7	19	8
China	22	10	21	10	24	10
Egypt	15	0	25	9	25	6
Ghana <sup>b</sup>	35	35	40	40	35	35
India	14	6	14	7	25	6
Jordan	11	5	6	5	10	0
Kenya	7	0	14	0	16	7
Pakistan <sup>c</sup>	0	0	0	0	0	0
South Africa <sup>c</sup>	0	0	0	0	0	0
Sudan <sup>d</sup>	0	0	0	0	4	0

<sup>1</sup>The first FETP was established in Thailand.

<sup>2</sup>FETP is a 2-year program and during any given year there are usually two cohorts of trainees, first year and second year.

<sup>3</sup>Brazil, Central Asia, Central America, India, Jordan, and Kenya.

Country/region	2004		2005		2006	
	Trainees <sup>a</sup>	Graduates	Trainees <sup>a</sup>	Graduates	Trainees <sup>a</sup>	Graduates
Thailand	8	0	18	0	33	8
Uganda	23	31	18	23	22	23
Zimbabwe	7	4	13	15	8	10
<b>Total</b>	<b>221</b>	<b>96</b>	<b>257</b>	<b>131</b>	<b>274</b>	<b>124</b>

Source: CDC.

<sup>a</sup>CDC was unable to determine whether the number of trainees each year includes trainees from previous classes or represents only new trainees. Therefore, we are unable to total the number of trainees across all 3 years.

<sup>b</sup>The Ghana FETP is a 1-year program.

<sup>c</sup>Program began enrolling trainees in 2007, although CDC provided support in 2006.

<sup>d</sup>The south Sudan FETP began in 2006.

# Appendix IV: IDSR

WHO/AFRO's IDSR aims to develop a comprehensive, functional system for disease surveillance that links epidemiologic surveillance with laboratory functions. CDC has provided technical assistance in support of IDSR in Africa since its inception in 1998. With funding from USAID, CDC's assistance has supported a variety of IDSR activities, including designing the overall framework for guiding the implementation of IDSR, developing national guidelines for strengthening public health laboratory networks in Africa, developing technical guidelines aimed at the district level for implementing IDSR, supporting regional training materials, supporting development of indicators for monitoring and evaluating IDSR implementation, and conducting an economic evaluation of the cost to implement IDSR. CDC has also provided assistance for a number of country-specific activities with USAID's support. Table 4 presents examples of country-specific IDSR activities supported by CDC and USAID from 2004 through 2006.

**Table 4: Examples of Country-Specific IDSR Activities Supported by CDC and USAID, 2004-2006**

Country	Activity
Tanzania	Undertook laboratory strengthening, including development and implementation of 23 job aids that were designed to support the collection, packaging, handling, labeling, and transporting of specimens; conducted outbreak investigation courses; maintained surveillance team.
Mali	Conducted a workshop on outbreak response and how to use the district-level IDSR materials; undertook laboratory training; supported the production of feedback bulletins on infectious disease surveillance; provided technical assistance for meningitis epidemic preparedness and response.
Kenya	Conducted training workshops for individuals who then returned to their districts and trained others there—training of trainers.
Burkina Faso	Collaborated on strengthening IDSR and conducted evaluation for meningitis surveillance system; provided technical assistance and materials support for laboratory surveillance; provided technical assistance for meningitis epidemic preparedness and response.
Ethiopia	Supported training on IDSR at regional levels; supported monitoring of timeliness and completeness of data reporting.
Ghana	Maintained and provided communications training to surveillance team; conducted outbreak investigation courses.
Uganda	Conducted outbreak investigation courses; supported laboratory specimen transportation system; maintained surveillance team.
Zimbabwe	Conducted outbreak investigation courses; maintained surveillance team.

Source: CDC.

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# Appendix V: GEIS

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Since 1996, DOD's GEIS has provided funding and professional support to a network of domestic and overseas military laboratories and medical organizations. GEIS began providing funding in 2005 on a project-by-project basis to five DOD overseas laboratories.<sup>1</sup> We identified 33 projects conducted in 2005 and 32 projects conducted in 2006 that had capacity-building components, including epidemiology and laboratory training, in conjunction with conducting surveillance and outbreak response.<sup>2</sup> (Tables 5 and 6 show the GEIS projects we identified as having capacity-building components in 2005 and 2006, respectively.) These projects were primarily conducted at the DOD overseas laboratories, although in 2005 and 2006, three projects each year were run out of the U.S. military health system. The funding obligated to all of the capacity-building projects constituted 47 percent of the GEIS budget in 2005 and 27 percent of the GEIS budget for 2006. These figures do not include funds designated for avian and pandemic influenza.

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<sup>1</sup>Prior to 2005, GEIS funded the overseas laboratories directly, without a project-by-project breakdown.

<sup>2</sup>Consistent with the scope of our engagement, we did not include projects funded from appropriations designated for avian influenza.

Table 5: GEIS Projects with Capacity-Building Components, 2005

DOD implementing unit	Projects with capacity-building components
<b>DOD overseas laboratories</b>	
Naval Medical Research Unit No. 2 (NAMRU-2), Jakarta, Indonesia	Surveillance and outbreak response in the emerging diseases program
	Surveillance in the viral diseases program
	Surveillance in the enteric diseases program
	Surveillance and outbreak response in the parasitic diseases program
Naval Medical Research Unit No. 3 (NAMRU-3), Cairo, Egypt	Hospital and laboratory-based surveillance for hemorrhagic fever viruses in Ukraine
	Regional surveillance for influenza in the Middle East, Africa, and Eastern Europe and in overseas military populations
	Response to outbreaks in the eastern Mediterranean and other support for WHO's Eastern Mediterranean Regional Office, including training and evaluation
	Laboratory information management, accessioning, and archiving system
	Maintain/broaden Egyptian disease surveillance network to include acute febrile illness, meningitis, and viral hepatitis
	Etiology of diarrhea in hospital-based (urban) system versus active community-based (rural) system
	Establish a regional network in eastern Mediterranean region for meningitis
Naval Medical Research Center Detachment (NMRCD), Lima, Peru	Outbreak response, classroom training, and electronic surveillance of infectious disease
	Surveillance of diarrhea in the bacterial diseases program
	Surveillance of dengue in the vectors of disease program
Armed Forces Research Institute of Medical Sciences (AFRIMS), Bangkok, Thailand	Influenza surveillance
	Febrile illness surveillance and Thai field site for training DOD personnel
	Zoonotic disease surveillance
	Drug resistance surveillance and pathogen identification
	Cambodia surveillance site development and capacity building
	Philippines site development and capacity building
	Response and readiness surge capacity
	Public health capacity building in Nepal
	Public health capacity building in partnership with the Royal Thai Army
	Maintain HIV serum repository in collaboration with the Royal Thai Army
United States Army Medical Research Unit-Kenya (USAMRU-K), Nairobi, Kenya	Epidemiology of diarrheal illness in Kenya
	Influenza surveillance in Kenya
	Infrastructure, including student attachment program
	Outbreak response
	Surveillance sites network
	Acute febrile illness surveillance in Kenya



DOD implementing unit	Projects with capacity-building components
<b>U.S. Military Health System</b>	
Air Force Institute for Operational Health (AFIOH)	Operation and expansion of DOD influenza surveillance system
United States Army Center for Health Promotion and Preventive Medicine-West (USACHPPM-West)	Laboratory surveillance in the Central America Military Health System
Walter Reed Army Institute of Research (WRAIR)	Establishing a Plasmodium vivax surveillance network in the Asia-Pacific region

Source: GAO analysis of DOD data.

**Table 6: GEIS Projects with Capacity-Building Components, 2006**

DOD implementing unit	Projects with capacity-building components
<b>DOD overseas laboratories</b>	
NAMRU-2 (Jakarta, Indonesia)	Syndromic surveillance in Vietnam
	Influenza surveillance and virus characterization in Indonesia
	Resistance to chloroquine or primaquine in Plasmodium vivax, and markers of resistance to artemisinin combined therapies in Indochina and East Timor
	Outbreak investigation and outbreak support
NAMRU-3 (Cairo, Egypt)	Development of the eastern Mediterranean regional rotavirus surveillance network
	Regional surveillance for respiratory viruses in the Middle East, Africa, and Eastern Europe
	Hospital and laboratory-based surveillance for hemorrhagic fever viruses and arboviruses
	Surveillance for avian influenza viruses
	Enhanced laboratory-based surveillance for patients with meningitis and pneumonia in the eastern Mediterranean region
	Regional response to outbreaks in the Middle East, Africa, and the Eurasian region, with relevant training support and program evaluation
NMRCDC (Lima, Peru)	Molecular and epidemiological surveillance of Leishmaniasis in Peru
	Surveillance for the dengue vector, Aedes aegypti, in urban Lima
	Respiratory illness surveillance in Central and South America
	Bacterial etiologies of febrile syndromes in a variety of populations throughout Peru
	Electronic disease surveillance systems in Peru—Alerta and Early Warning Outbreak Recognition System
	Epidemiological training in the Americas
AFRIMS (Bangkok, Thailand)	Unit-based infectious disease surveillance in Thai border areas
	Infectious disease surveillance among Royal Thai Army recruits
	Multi-nation surveillance of diarrhea etiology and antimicrobial-resistant enteric pathogens
	Detection of artemisinin resistance and surveillance of antimalarial drug resistance in Asia
	Establishing antimalarial drug resistance research at Walter Reed/AFRIMS Research Unit-Nepal

<b>DOD implementing unit</b>	<b>Projects with capacity-building components</b>
USAMRU-K (Nairobi, Kenya)	Sentinel human influenza surveillance in Asia
	Sentinel surveillance for emerging diseases causing dengue-like or acute encephalitis syndrome in the Philippines
	Febrile illness surveillance and characterization in Nepal
	Education, capacity building, and training
	Study site network and laboratory support
U.S. Military Health System	Epidemiology of malaria and drug sensitivity patterns in Kenya
	Epidemiology of diarrheal illness in Kenya
	Acute febrile illness surveillance in Kenya
AFIOH and USACHPPM-West	Collaboration for laboratory-based respiratory surveillance in Central America
USACHPPM-West	Disease outbreak surveillance program in Central America Military Health System
WRAIR	Malaria microscopy center for excellence in Kisumu, Kenya

Source: GAO analysis of DOD data.

# Appendix VI: Comments from the Department of Defense

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



## HEALTH AFFAIRS

## THE ASSISTANT SECRETARY OF DEFENSE

1200 DEFENSE PENTAGON  
WASHINGTON, DC 20301-1200

Mr. David Gootnick  
Director, International Affairs and Trade  
U.S. Government Accountability Office  
441 G Street, N.W.  
Washington, DC 20548

SEP 18 2007

Dear Mr. Gootnick:

This is the Department of Defense (DoD) response to the Government Accountability Office (GAO) Draft Report, GAO-07-1186 "GLOBAL HEALTH: U.S. Agencies Support Several Programs to Build Overseas Capacity for Infectious Disease Surveillance," dated August 17 (GAO Code 320459).

Thank you for the opportunity to review and comment on the draft report. I appreciate the collaborative, insightful, and thorough approach that your team has taken with this important issue. This report provides a concise, comprehensive overview of the collaborative efforts of the Centers for Disease Control and Prevention, United States Agency for International Development and the DoD to build overseas capacity for infectious disease surveillance.

However, it is necessary to provide clarification on the extent of global involvement, and the goals and priorities, of the DoD-Global Emerging Infections System (DoD-GEIS). As presented in the report, the great majority of the DoD-GEIS overseas programs are conducted out of the DoD overseas laboratories in Egypt, Kenya, Indonesia, Peru, and Thailand. What is not clear in the GAO report is that these laboratories develop regional programs that include many countries in their geographic areas. Additionally, the report notes that DoD-GEIS does not consider capacity building a primary goal. Capacity building is contained in DoD-GEIS' 3<sup>rd</sup> and 4<sup>th</sup> Priority Goals. In addition, DoD-GEIS has always been interested in the lasting impact of its programs on host nation surveillance capacity. More details on DoD-GEIS are included in the attachment.

Again, thank you for the opportunity to provide these comments. My points of contact for additional information are Ms. Dee Dodson Morris (Functional) at (703) 845 8339, or [Dee.Morris@ha.osd.mil](mailto:Dee.Morris@ha.osd.mil); and Mr. Gunther Zimmerman (Audit Liaison) at (703) 681-3492, or [Gunther.Zimmerman@tma.osd.mil](mailto:Gunther.Zimmerman@tma.osd.mil).

Sincerely,

A handwritten signature in black ink, appearing to read "S. Ward Casscells".

S. Ward Casscells, MD

Enclosure:  
As stated

**GOVERNMENT ACCOUNTABILITY OFFICE  
DRAFT REPORT DATED AUGUST 17, 2007  
GAO-07-1186 (GAO CODE 320459)**

**“GLOBAL HEALTH: US AGENCIES SUPPORT SEVERAL PROGRAMS TO  
BUILD OVERSEAS CAPACITY FOR INFECTIOUS DISEASE  
SURVEILLANCE”**

**DEPARTMENT OF DEFENSE COMMENTS**

**General Comments**

As presented in the report, the great majority of the Department of Defense-Global Emerging Infectious System (DoD-GEIS) overseas programs are conducted out of the DoD overseas laboratories in Egypt, Kenya, Indonesia, Peru, and Thailand. What is not clear in the Government Accountability Office report is that these laboratories develop regional programs that include many countries in their geographic areas. The DoD-GEIS staff estimates that during the time period reviewed by the GAO, DoD-GEIS programs were in operation or under consideration in at least 36 different countries. For example, the Early Warning Outbreak Recognition System (EWORS), a disease surveillance system operated out of the lab in Indonesia, was operating in Indonesia and three other countries in Southeast Asia (Laos, Cambodia, and Vietnam). Additionally, the GAO identifies DoD-GEIS-supported, locally operated, fixed laboratories in Nepal, Cambodia, and Ghana, in their report, but these countries are not identified as GEIS areas of operation on Figure 2.

The report notes that the DoD does not plan to evaluate the DoD-GEIS program's impact on host countries' surveillance capacity since DoD-GEIS does not consider capacity building a primary program goal. The DoD-GEIS operates on four goals:

1. Surveillance and Detection,
2. Response and Readiness,
3. Integration and Innovation, and
4. Cooperation and Capacity Building.

The first two goals are given the highest priority, with Surveillance and Detection the first priority. The third and fourth goals are important and success of the first two goals could not be achieved if these were neglected.

The DoD-GEIS core program (exclusive of avian influenza/pandemic influenza appropriated monies, approximately \$12 million/year) is modest and directed at developing, maintaining, and upgrading surveillance systems and programs that can detect threats reliably and early. Since the beginning of DoD-GEIS, the program staff

See comment 1.

See comment 2.

has been interested in the lasting impact of its programs on host nation surveillance capacity. A peer-reviewed 2003 publication (*Military Medicine*, Vol. 168, pages 843–848, October 2003) provides an evaluation of a DoD-GEIS-sponsored, collaborative Caribbean public health laboratory project. In 2006, DoD-GEIS initiated and sponsored ongoing, well-defined reviews of surveillance systems in South America and Southeast Asia that is host nation operated with assistance from the DoD laboratories in those areas.

These reviews will provide information on how well these programs have improved local capacity for disease surveillance. The above two examples are outside of the parameters addressed by the GAO (the Caribbean project preceded the GAO period of interest and the recent surveillance system reviews are funded by avian influenza/pandemic influenza money). However, these examples demonstrate DoD-GEIS interest in evaluating the impact of its programs on host nation capacity and its willingness to initiate further evaluative programs if resources are available.

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The following are GAO's comments on DOD's letter dated September 18, 2007.

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## GAO Comments

1. As DOD noted, in addition to maintaining overseas laboratories in five countries, it also funds projects, which it refers to as programs, in many countries. Appendix V identifies all GEIS projects with capacity-building elements. These projects are generally small-scale efforts; for instance, in 2006, GEIS provided funding ranging from \$3,000 to \$250,000 for the projects listed in table 6, with the median level of project funding at \$88,500.
2. We clarified that DOD and others have conducted reviews of some of the individual GEIS projects.

# Appendix VII: Comments from the Department of Health and Human Services

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



DEPARTMENT OF HEALTH & HUMAN SERVICES

Office of the Assistant Secretary  
for Legislation

Washington, D.C. 20201

SEP 14 2007

David Gootnick  
Director, International Affairs and Trade  
U.S. Government Accountability Office  
Washington, DC 20548

Dear Mr. Gootnick:

Enclosed are the Department's comments on the U.S. Government Accountability Office's (GAO) draft report entitled, "Global Health: U.S. Agencies Support Several Programs to Build Overseas capacity for infectious Disease Surveillance" (GAO 07-1186)

The Department has provided several technical comments directly to your staff.

The Department appreciates the opportunity to review and comment on this draft before its publication.

Sincerely,

*Rebecca Hemard*

*for*

Vincent J. Ventimiglia  
Assistant Secretary for Legislation

**HHS COMMENTS ON U.S. GOVERNMENT ACCOUNTABILITY OFFICES DRAFT  
CORRESPONDENCE “GLOBAL HEALTH: U.S. AGENCIES SUPPORT SEVERAL  
PROGRAMS TO BUILD OVERSEAS CAPACITY FOR INFECTIOUS DISEASE  
SURVEILLANCE (GAO-07-1186)**

HHS appreciates GAO for the review and synthesis of complex information on surveillance efforts across the U.S. Government. This type of review is useful as investments continue in these programs. In order to enhance the value of the final report, HHS recommends that GAO make the following changes:

The component parts of the Global Disease Detection Program (GDD) are not adequately described and need to be clarified throughout the draft. The primary components of CDC's GDD program are the five GDD Centers, located in Thailand, Kenya, Egypt, Guatemala, and China. The GDD program was built on CDC's existing international expertise in public health surveillance, training, and laboratory methods, and brought together three previously established and proven programs: the Field Epidemiology Training Program (FETP), the International Emerging Infections Program (IEIP), and influenza activities. This should be clearly stated (in both the Highlights page, and also in the draft introduction where the programs are described) to show the relationship among these programs.

The draft states on the Highlights page, on page 3 and page 8 that U.S. agencies spent approximately \$85M for global infectious disease surveillance capacity. The draft (pg. 5) also states that SARS was estimated to cost between \$11 billion and \$18 billion on Asian economies. CDC recommends this overall figure of \$85M over 3 years (or approximately \$30M per year) be placed directly in the context of potential economic costs of a poorly detected or contained emerging infectious disease. Specifically, CDC suggests two changes to emphasize this point:

1. Add another example (in addition to the SARS example) to show economic impact, - **“In addition, the cost to the US economy of a modest influenza pandemic is estimated at \$100 billion to \$200 billion (Brahmbhatt, World Bank).”**

2. Include the \$85M figure and the economic estimates of SARS and influenza pandemic within the same section (ideally a “conclusions” section) of the draft to show context and better frame the investment of these programs. CDC's investment in programs that build capacity for non-specific threats or emerging infectious diseases is minimal when considering the potential economic impact of such a disease.

The scope of the review is limited to capacity building for infectious disease surveillance, but the definition of capacity building is not clearly articulated. As noted above, the investment in the specific types of capacity building included in the draft (capacity building for emerging infectious threats, not including disease-specific efforts) is relatively small in comparison to the potential impact. However, the draft does not recognize the contributions of other disease-specific programs in capacity building.



**HHS COMMENTS ON U.S. GOVERNMENT ACCOUNTABILITY OFFICES DRAFT  
CORRESPONDENCE “GLOBAL HEALTH: U.S. AGENCIES SUPPORT SEVERAL  
PROGRAMS TO BUILD OVERSEAS CAPACITY FOR INFECTIOUS DISEASE  
SURVEILLANCE (GAO-07-1186)**

See comment 4.

One page 2, the draft states that GAO did not review capacity-building efforts in programs that focus on specific diseases (such as polio, TB, malaria, avian influenza, and HIV/AIDS) but does not state why these programs were omitted from the review. In addition, the draft would benefit from stating clearly in the text, rather than in the footnotes, that there are other important components to international surveillance not described in this draft (see technical comments, page 5, paragraph 1, line 2).

See comment 5.

CDC believes disease-specific programs are important to building capacity and recognizes that other capacity-building efforts are also being built through other programs such as Global AIDS program, Global Immunization Division, President’s Malaria Initiative, etc.

In addition, GAO included the Global Emerging Infections Surveillance Response System (GEIS) in the review, even though GEIS stated (pg 16 and 22) that capacity building is not its primary purpose. Because the draft excludes some important capacity-building programs while including others (less focused on capacity-building), it presents an incomplete and potentially misleading representation of all overseas capacity-building investments by the US Government.

See comment 6.

As stated in the draft, GDD and FETP evaluation frameworks have recently been implemented. Although CDC is in the early stages of data collection on performance indicators, it is too early at this time to make conclusions on the progress of these programs. Therefore, CDC suggests that the final report include a recommendation to the Secretary of Health and Human Services (HHS) that CDC provide a Report to Congress on the progress of these programs within 1-3 years of the report release date.

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The following are GAO's comments on HHS's letter dated September 14, 2007.

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## GAO Comments

1. Our description of GDD focused on the types of capacity-building activities undertaken by GDD from 2004 to 2006, not on GDD's history. However, in response to CDC's comments, we have added information regarding the preexisting programs that make up GDD. Additionally, we describe the FETPs in detail and also refer to them under our description of GDD. As we stated in our introduction, we did not focus on efforts funded by appropriations for specific diseases, including influenza activities, although the report does acknowledge that disease-specific activities have improved surveillance. Furthermore, during the timeframe of our review, the IEIP was established in only one location, Thailand, prior to the establishment of the GDD centers.
2. The report includes an estimate of the economic cost of severe acute respiratory syndrome (SARS).
3. The report's objectives clearly state that our focus was epidemiology and laboratory capacity-building programs. The report acknowledges the contribution of surveillance systems for specific diseases to overall disease surveillance efforts.
4. As our rationale for excluding disease-specific programs clearly states, although earlier efforts to improve surveillance worldwide focused on individual diseases, the United States and other countries initiated a broader effort in the mid-1990s to ensure that countries can detect outbreaks of previously unknown infectious diseases. As noted, our review focused on these broader efforts. Regarding other components of international surveillance, see comment 3.
5. We disagree that our report presents an incomplete picture of capacity-building programs. We identified and evaluated the key U.S. programs to build developing countries' broader capacity for infectious disease surveillance and specifically excluded programs for disease-specific efforts from our review. Regarding GEIS, capacity building is one of its goals, and our review showed that DOD's overseas laboratories, where many of the GEIS projects are run, also house CDC's GDD efforts, specifically in Egypt and Kenya.
6. As noted in our report, we were unable to assess CDC's program evaluation efforts because these activities had just begun in 2006. However, we support CDC's interest in keeping Congress informed of the progress and impact of the FETP and GDD programs.

# Appendix VIII: Comments from the U.S. Agency for International Development

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



SEP 7 2007

David Gootnick  
Director  
International Affairs and Trade  
U.S. Government Accountability Office  
441 G Street, N.W.  
Washington, D.C. 20548

Dear Mr. Gootnick:

I am pleased to provide the U.S. Agency for International Development's (USAID) formal response to the Government Accountability Office (GAO) draft report titled "Global Health: U.S. Agencies Support Several Programs to Build Overseas Capacity for Infectious Disease Surveillance" (GAO-07-1186).

First, we would like to take this opportunity to congratulate the GAO on the outstanding job of responding to a Congressional inquiry on the status of building overseas capacity for infectious disease surveillance. USAID fully recognizes the complexity of this subject and believes that this draft report provides valuable insights into the issues concerning the ability of public health officials to detect and report infectious diseases.

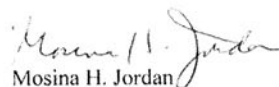
This issue is clearly of global significance, given the potential for the global spread of disease and the ability of surveillance to contribute to significant reductions in morbidity and mortality within developing countries. As such, USAID has been a strong supporter of programs to build surveillance capacity at the local level. We are proud to work closely with our U.S. Government partners, particularly the Centers for Disease Control and Prevention (CDC) and our international partners, particularly the World Health Organization (WHO).

U.S. Agency for International Development  
1300 Pennsylvania Avenue, NW  
Washington, DC 20523  
[www.usaid.gov](http://www.usaid.gov)

- 2 -

Further comments on the significant level of investment USAID's disease-specific programs make to capacity building for surveillance are enclosed. Thank you for the opportunity to respond to the GAO draft report and for the courtesies extended by your staff in the conduct of this review.

Sincerely,

  
Mosina H. Jordan  
Counselor to the Agency

Enclosure: a/s

- 3 -

**Enclosure: USAID Comments on the GAO report entitled "Global Health: U.S. Agencies Support Several Programs to Build Overseas Capacity for Infectious Disease Surveillance" (GAO-07-1186)**

As the draft report indicates, the GAO did not review capacity-building efforts in programs that focus on specific diseases. USAID fully understands that such a comprehensive review would have been a massive undertaking. Furthermore, USAID recognizes that there are limitations as to what can be done to strengthen overall disease surveillance capability through a disease-specific approach. However, at the same time, USAID's expenditure levels in the areas of disease surveillance are determined by appropriation patterns and the majority of our funding is disease-specific. Therefore, excluding USAID's disease-specific programs overlooks the significant level of investment these programs make to capacity building for surveillance. As a result, USAID would like to emphasize the important contributions of its disease-specific programs in this area, namely polio, tuberculosis (TB), avian influenza (AI), malaria, and HIV/AIDS. For example:

- TB: In the area of TB, USAID's Bureau for Global Health has invested approximately \$10 million since FY 1999 in computerized electronic TB registries, global TB monitoring surveillance, multi-drug resistant TB (MDR-TB) surveillance, and TB monitoring and evaluation. The Global TB surveillance program collects data from over 200 countries and releases the information in an annual report. The means for collecting and reporting that information at the country level has contributed significantly to local capacity to collect data and use it to manage patients and programs. USAID has made a significant contribution to this effort.
- AI: In FY 2005 and FY 2006 the USAID Avian Influenza Program obligated just over \$8 million in support of human infectious disease surveillance activities in Asia, Europe and Eurasia, Africa and Latin America. These activities are focused on strengthening laboratory and diagnostic capacity, as well as active field surveillance for influenza-like illnesses. While currently focused on H5N1 influenza, this work will strengthen overall surveillance for zoonotic diseases in developing countries around the world.
- Polio: Since 1985, USAID has provided approximately \$290 million for polio surveillance in over 40 countries in Africa, South Asia, the Near East, and former Newly Independent States. These funds have created a global network made up of 148 national and regional laboratories capable of isolating, sero-

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typing and, in many cases, genetic sequencing of polio viruses. Many are also expanding their analysis to other vaccine-preventable diseases, such as measles and rubella. These funds also support a network of several hundred medical surveillance officers and community-disease detection informants trained to detect, report and investigate cases of polio, and, increasingly, other diseases of health importance.

The GAO draft report notes in several sections, including page 1 paragraph 2 and Appendix I, that the authors examined the costs of key U.S. programs to develop epidemiology and laboratory capacity. However, the data gathered from USAID on its investments in these areas was obligation data, not cost data. The actual cost of developing epidemiology and laboratory capacity are not quantified in the draft report and are significantly greater than the amount USAID has been able to invest, based on Congressional appropriations.

Further, the GAO draft report briefly mentions "additional activities supporting capacity building" on page 17 and includes a short list of example activities carried out in this category. However, the work completed under this category represents a substantial proportion of USAID's obligations in FY 2004-2006 for capacity building for surveillance. Taking this into account, USAID would like to recognize the following additional activities in this category:

- The GAO draft report makes reference to the development of tools and guidelines for Integrated Disease Surveillance and Response (IDSR). However, the draft report does not fully describe the significant level of investment and the activities undertaken by the Partners for Health Reform<sup>plus</sup> (PHR<sup>plus</sup>) project. Implemented by Abt Associates with support from USAID, this project worked closely with the WHO African Regional Office (AFRO) and the Government of Tanzania to develop the initial training manuals for IDSR, complete a cost analysis, evaluate community surveillance systems in Africa, and establish a model program in Tanzania. This initial work provided the foundation and support for the activities outlined in paragraph 2 on page 15 of the draft report.
- USAID provided support to WHO to strengthen national capacity for surveillance, early warning and response through the provision of technical guidance and support for the development and implementation of these systems. These activities included surveillance system assessments, plans of action, development of standards, guidelines and tools for early warning and response, development of an early warning and response tool kit,

See comment 1.

See comment 2.

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support to human capacity building, and strengthening post-outbreak capabilities.

- USAID provided funding to WHO to support biosafety activities in storage, handling and transport of dangerous pathogens. These activities addressed the need for enhancement of biological safety and laboratory biosecurity procedures and practices in facilities handling infectious substances.
- USAID supported WHO regional offices for Africa and Europe to strengthen public health laboratory capacities. These activities assisted WHO to identify sustainable ways of meeting national laboratory requirements for maintenance of diagnostic capacity for epidemic-prone diseases.
- USAID provided support to WHO to establish National External Quality Assessment Units. These activities engaged national public health laboratories in the evaluation of diagnostic performance within their countries.

Finally, as the GAO draft report indicates, surveillance provides essential information for action against infectious disease threats. USAID would like to emphasize the importance of “routine” surveillance, which, while not as visible on the global stage as disease-specific surveillance activities, has the potential for significant improvements in health status and mortality reduction. Activities for routine disease surveillance are usually not within the range of disease-specific surveillance programs and need to be strengthened to allow countries to utilize their limited resources more effectively, promote better policy decisions, and organize health services in a way that best promotes the population’s overall health.

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The following are GAO's comments on USAID's letter dated September 7, 2007.

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## GAO Comments

1. As USAID noted, our draft report used the terms "obligations" and "costs" interchangeably, and the cost of implementing these activities is greater than the amounts obligated to capacity building for infectious disease surveillance. We have revised the report where appropriate to make it clear that our work refers only to "obligations" rather than "costs."
2. Regarding additional capacity-building activities supported by USAID obligations to entities such as Partners for Health Reform*plus* project and WHO, table 1 of our report includes funds obligated to these entities in fiscal years 2004 through 2006 in support of these capacity-building activities.



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# Appendix IX: GAO Contact and Staff Acknowledgments

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## GAO Contact

David Gootnick, (202) 512-3149 or [gootnickd@gao.gov](mailto:gootnickd@gao.gov)

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## Acknowledgments

In addition to the contact named above, Audrey Solis, Assistant Director; Julie Hirshen; Diahanna Post; Elizabeth Singer; and Celia Thomas made key contributions to this report. David Dornisch, Etana Finkler, Reid Lowe, Grace Lui, Susan Ragland, and Eddie Uyekawa provided technical assistance.

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